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L3	6	("5519825" "5628012" "5655067" "5706417" "5719786" "5867175").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/03/18 13:13
L4	1	("6392652").URPN.	USPAT	OR	OFF	2005/03/18 13:14
L5	10	("3747087" "5519825" "5590261" "5628012" "5655067" "5706417" "5719786" "5867175" "6369822" "6392652").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/03/18 13:16
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Visualization and Computer Graphics, IEEE Transactions on , Volume: 1 , Issue: 3 , Sept. 1995

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Lewis, B.M.; Tran, H.T.; Read, M.E.; Ives, R.L.;

Plasma Science, IEEE Transactions on , Volume: 32 , Issue: 3 , June 2004

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5 Development of a quantitative flow visualization tool for application industrial wind tunnels

Machacek, M.; Rosgen, T.;

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Kenwright, D.N.; Lane, D.A.;

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Kabata, Y.; Nishino, H.; Utsumiya, K.; Korida, K.;
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Peter, J.; Muller, T.; Freyer, R.;
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Visualization, 1993. Visualization '93, Proceedings., IEEE Conference on , 25-27
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**131 Distribution systems loss minimum re-configuration by simulated
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Nara, K.; Kitagawa, M.;
Advances in Power System Control, Operation and Management, 1991. APSCC
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Relevance scale ☐ ☐ ☐ ☐ ☐81 [Rendering: Path tracing using the AR350 processor](#)

Christophe Cassagnabère, François Rousselle, Christophe Renaud

 June 2004 **Proceedings of the 2nd international conference on Computer graphics and interactive techniques in Australasia and Southe East Asia**

 Full text available: [pdf\(351.35 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The AR350 is a ray tracing processor developed by Advanced Rendering Technologies. By using AR350 processors arrays, the PURE and RenderDrive products achieve high performances in Ray Tracing based rendering. In this paper we present an extension of their capabilities to global illumination computation by implementing Path Tracing based methods. Because the core program of these rendering appliances is not modifiable but driven by a Render-Man compliant interface, we achieve this goal by writing ...

Keywords: AR350, RenderMan, global illumination, hardware implementation, path tracing

82 [Late-breaking results: MIT is the limit: Bringing sketching tools to keychain computers with an acceleration-based interface](#)

Golan Levin, Paul Yarin

 May 1999 **CHI '99 extended abstracts on Human factors in computing systems**

 Full text available: [pdf\(260.79 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

We report the use of an embedded accelerometer as a gestural interface for an extremely small ("keychain") computer. This tilt- and shake-sensitive interface captures the expressive nuances of continuously varying spatio-temporal input, making possible a set of applications heretofore difficult or impossible to implement in such a small device. We provide examples of such applications, including a paint program and some simple animation authoring systems.

Keywords: accelerometers, gestural interfaces, keychain computers

83 [A practical analytic model for daylight](#)

A. J. Preetham, Peter Shirley, Brian Smits


 July 1999 **Proceedings of the 26th annual conference on Computer graphics and interactive techniques**

 Full text available: [pdf\(230.74 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: aerial perspective, illumination, skylight, sunlight

84 Decorating implicit surfaces

Hans K hling Pedersen

September 1995 **Proceedings of the 22nd annual conference on Computer graphics and interactive techniques**Full text available:  [pdf\(421.73 KB\)](#) [ps\(1.39 MB\)](#)Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)85 Particle animation and rendering using data parallel computation


Karl Sims

September 1990 **ACM SIGGRAPH Computer Graphics , Proceedings of the 17th annual conference on Computer graphics and interactive techniques**, Volume 24 Issue 4Full text available:  [pdf\(5.82 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Techniques are presented that are used to animate and render particle systems with the Connection Machine CM-2, a data parallel supercomputer. A particle behavior language provides an animator with levels of control from kinematic spline motions to physically based simulations. A parallel particle rendering system allows particles of different shapes, sizes, colors and transparencies to be rendered with antialiasing, hidden surfaces, and motion-blur. One virtual processor is assigned to each pri ...

86 Interactive scientific visualization and parallel display techniques


J. A. Sethian, J. B. Salem, A. F. Ghoniem

November 1988 **Proceedings of the 1988 ACM/IEEE conference on Supercomputing**Full text available:  [pdf\(1.43 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we describe a new graphics environment for essentially real-time interactive visualization of computational fluid mechanics. Within this environment, the researcher may interactively examine fluid data on a framebuffer with animated flow visualization diagnostics which mimic those in the experimental laboratory. This provides an effective and interactive way to analyze the underlying physical mechanisms, and to compare results with laboratory experiment. The system ...

87 A collaborative and interdisciplinary computer animation course


David S. Ebert, Dan Bailey

August 2000 **ACM SIGGRAPH Computer Graphics**, Volume 34 Issue 3Full text available:  [pdf\(1.49 MB\)](#)Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

David Ebert and Dan Bailey have developed an innovative and supportive environment for art and computer science students to collaborate on large scale graphics projects. This is exciting because in many academic institutions, students from these two disciplines never have a chance to meet each other, much less work together. Ebert hails from the CSEE Department at the University of Maryland Baltimore County, and Bailey is a member of the Visual Arts Department at UMBC. In this article, they disc ...

88 Game design & programming concentration within the computer science curriculum

Ron Coleman, Mary Krembs, Alan Labouseur, Jim Weir

February 2005 **ACM SIGCSE Bulletin , Proceedings of the 36th SIGCSE technical symposium on Computer science education**, Volume 37 Issue 1Full text available:  [pdf\(139.46 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper describes initiatives at Marist College to develop a Game Concentration in the undergraduate Computer Science curriculum. These initiatives contemplate recommendations for existing courses as well as adoption of new courses. We also consider activities of the Association of Computing Machinery (ACM) in this area and

opportunities for students beyond the classroom.

Keywords: curricular initiative, game programming

89 Interactive manipulation of rigid body simulations

Jovan Popović, Steven M. Seitz, Michael Erdmann, Zoran Popović, Andrew Witkin

July 2000 **Proceedings of the 27th annual conference on Computer graphics and interactive techniques**

Full text available:  pdf(886.24 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Physical simulation of dynamic objects has become commonplace in computer graphics because it produces highly realistic animations. In this paradigm the animator provides few physical parameters such as the objects' initial positions and velocities, and the simulator automatically generates realistic motions. The resulting motion, however, is difficult to control because even a small adjustment of the input parameters can drastically affect the subsequent motion. Furthermore, the animator o ...

Keywords: animation with constraints, physically based animation

90 Interactive Maximum Projection Volume Rendering

Wolfgang Heidrich, Michael McCool, John Stevens

October 1995 **Proceedings of the 6th conference on Visualization '95**

Full text available:  pdf(852.81 KB)

Additional Information: [full citation](#), [abstract](#), [citations](#)

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Maximum projection is a volume rendering technique that, for each pixel, finds the maximum intensity along a projector. For certain important classes of data, this is an approximation to summation rendering which produces superior visualizations. In this paper we will show how maximum projection rendering with additional depth cues can be implemented using simple affine transformations in object space. This technique can be used together with 3D graphics libraries and standard graphics hardware, t ...

Keywords: maximum rendering, summation rendering, volume visualization, interactive computer graphics, geometric transformation, hardware accelerated rendering

91 MCMR: a fluid view on time dependent volume data

Wim de Leeuw, Robert van Liere

May 2003 **Proceedings of the symposium on Data visualisation 2003**

Full text available:  pdf(2.22 MB)

Additional Information: [full citation](#), [abstract](#), [index terms](#)

Mass Conservative Motion Reconstruction is a new method for estimating motion in time dependent volume data. A time dependent vector field representing the movement of the data is computed from a sequence of scalar volume data sets. The principle of mass conservation in a continuum is used during the reconstruction. Standard flow visualization techniques are used for the visualization of the derived vector field. This paper presents the underlying concepts of MCMR, its implementation, its accuracy ...

Keywords: conservation of mass, flow visualization, motion reconstruction, vector fields, volume visualization

92 Session P15: multidimensional, motion, and information visualization: BM3D: motion estimation in time dependent volume data

Wim de Leeuw, Robert van Liere

October 2002 **Proceedings of the conference on Visualization '02**

Full text available:  [pdf\(1.81 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper describes BM3D: a method for the analysis of motion in time dependent volume data. From a sequence of volume data sets a sequence of vector data sets representing the movement of the data is computed. A block matching technique is used for the reconstruction of data movement. The derived vector field can be used for the visualization of time dependent volume data. The method is illustrated in two applications.

Keywords: biomedical imaging, feature tracking, vector fields, volume visualization

93 [Modeling water for computer animation](#)

Nick Foster, Dimitris Metaxas

July 2000 **Communications of the ACM**, Volume 43 Issue 7

Full text available:  [pdf\(680.79 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)
 [html\(30.76 KB\)](#)



94 [Graphical modeling and animation of brittle fracture](#)

James F. O'Brien, Jessica K. Hodgins

July 1999 **Proceedings of the 26th annual conference on Computer graphics and interactive techniques**

Full text available:  [pdf\(1.64 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



Keywords: animation techniques, cracking, deformation, dynamics, finite element method, fracture, physically based modeling, simulation

95 [Toward visual debugging: integrating algorithm animation capabilities within a source-level debugger](#)

Sougata Mukherjea, John T. Stasko

September 1994 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 1 Issue 3

Full text available:  [pdf\(1.87 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)



Much of the recent research in software visualization has been polarized toward two opposite domains. In one domain that we call data structure and program visualization, low-level canonical views of program structures are generated automatically. These types of views, which do not require programmer input or intervention, can be useful for testing and debugging software. Often, however, their generic, low-level views are not expressive enough to convey adequately how a pro ...

Keywords: algorithm animation, debugging, programming environments, software visualization, user interfaces

96 [Global illumination: Importance sampling with hemispherical particle footprints](#)

Heinrich Hey, Werner Purgathofer

April 2002 **Proceedings of the 18th spring conference on Computer graphics**

Full text available:  [pdf\(348.48 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)



We present a new importance sampling technique for stochastic ray-based global illumination methods. It allows to enhance the efficiency of global illumination calculations in general scenes with complex illumination settings by selecting preferably those sampling or shooting directions which yield a high contribution. The probability density functions for this are generated with a photon map or importance map that represents the expected contribution. An outgoing direction for a given point in ...

Keywords: global illumination, importance map, importance sampling, particle map, photon map

97 3-2 VRC in edutainment: Simulation on pattern design in group calisthenics

Qingge Ji, Zhigeng Pan, Lin Mei

June 2004 **Proceedings of the 2004 ACM SIGGRAPH international conference on Virtual Reality continuum and its applications in industry**

Full text available:  [pdf\(184.95 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Because the transformation of alignments and patterns in group calisthenics are complex, it will spend a very long time to rehearse group calisthenics. To reduce rehearsal time, we studied group calisthenics training simulation. This paper gives several path-planning methods and a collision avoidance algorithm, and uses virtual human crowds to simulate the transforming method of alignment and pattern. Our new algorithm is simpler and more efficient than former methods. This method has been used ...

Keywords: collision avoidance, group calisthenics, path planning, sports simulation, virtual crowds

98 A progressive multi-pass method for global illumination

Shenchang Eric Chen, Holly E. Rushmeier, Gavin Miller, Douglass Turner

July 1991 **ACM SIGGRAPH Computer Graphics , Proceedings of the 18th annual conference on Computer graphics and interactive techniques**, Volume 25 Issue 4

Full text available:  [pdf\(5.76 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A new progressive global illumination method is presented which produces approximate images quickly, and then continues to systematically produce more accurate images. The method combines the existing methods of progressive refinement radiosity, Monte Carlo path tracing and light ray tracing. The method does not place any limitation on surface properties such as ideal Lambertian or mirror-like. To increase efficiency and accuracy, the new concepts of light source reclassification, caustics recon ...

Keywords: Monte Carlo, Ray Tracing, caustics, global illumination, progressive refinement, radiosity

99 Visualization of rotation fields

Mark A. Livingston

October 1997 **Proceedings of the 8th conference on Visualization '97**


Full text available:  [pdf\(659.58 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)
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Keywords: scientific visualization, stream surfaces, streamlines, tufts

100 Rendering: Scalable photon splatting for global illumination

Fabien Lavignotte, Mathias Paulin

February 2003 **Proceedings of the 1st international conference on Computer graphics and interactive techniques in Australasia and South East Asia**

Full text available:  [pdf\(11.11 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we present a new image based method for computing efficiently global illumination using graphics hardware. We propose a two pass method to compute global lighting at each pixel. In the first pass, photons are traced from the light sources and their

hit points are stored. Then, in the second pass, each photons hit point is splatted on the image to reconstruct the irradiance. The main advantages of our method in comparison with previous approaches is scalability. Indeed, it can be u ...

Keywords: density estimation, global illumination, graphics hardware, photon tracing

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